

PATENT ABSTRACTS OF JAPAN

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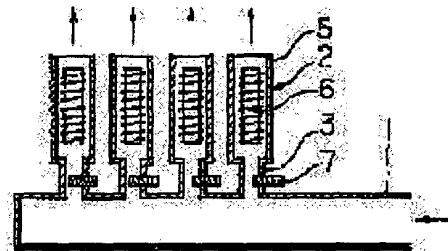
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(54) MULTIPLE AIR HEATER

(57)Abstract:

PURPOSE: To equalize temperatures of hot air leaving each heater unit by correcting the differences in the quantity of air passing through each heater unit due to the differences in positions in the arrangement of the heater units by means of a flow adjustment mechanism.

CONSTITUTION: A flow adjusting screw 7 for reducing the cross-sectional area of each pipe 3 is threaded into the pipe 3 which connects each heater unit 2 with a common feed air pipe 1. By adjusting each of the screws 7, the differences in the quantity of air passing through each heater unit due to the differences in the position between the heater units, No.1-No.4, with respect to the pipes 3 are corrected. And when actual temperature of hot air leaving each heater unit differs from each other due to the differences in resistance of heater elements 6, and the differences in the size and draft resistance of quartz pipes 5, the screws 7 are finely adjusted. As a result, temperatures of hot air from each of the heater units can be adjusted to a desired value, thereby increasing the durability thereof.



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CLAIMS

[Claim(s)]

[Claim 1] The multiple-string type air preheater which consists of an airpipe, two or more heater units which are arranged mutually and were arranged in accordance with the shaft orientations of this airpipe, each [these] heater unit, piping which opens between the above-mentioned airpipes for free passage, respectively, and the flow-regulation mechanism for adjusting the flow rate of the air to each above-mentioned piping, and is characterized according to this flow-regulation mechanism by enabling it to amend the difference of the air capacity which passes each heater unit produced by difference of the array position at least.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to a multiple-string type air preheater and the multiple-string type air preheater especially used for heating in the cases, such as de-burring of a plastic, welding of plasticity plastics, soldering of IC, and a seal of the container for a paper pack.

[0002]

[Description of the Prior Art] Piping which drawing 3 shows the conventional multiple-string type air preheater, and opens for free passage between an airpipe with common 1, two or more tubed heater units which estranged 2 mutually in accordance with the shaft orientations of this airpipe 1, and were arranged, and the airpipe 1 with 3 [common to this each heater unit and above], respectively, and 4 are the air-flow-rate adjustable valves inserted in the duct of the airpipe 1 common to the above.

[0003] Each above-mentioned heater unit 2 The transparent quartz tube 5 with ends opening of 15mm, for example, an outer diameter, a bore [of 12.5mm], and a length of 70mm, It consists of the heater element 6 of the iron chromium aluminum system arranged in this quartz tube 5, a Nichrome system, or a platinum system. They are 2 kg/cm² in an airpipe 1. The air sent by the following pressures is heated by the heater element 6, when it passes along a quartz tube 5, and as it becomes 800 degrees C, and 50l. the hot blast for /from the outlet of each quartz tube 5 and is shown in an arrow, it is emitted to a workpiece.

[0004]

[Problem(s) to be Solved by the Invention] However, in such a conventional multiple-string type air preheater, the life of each heater unit 2 was not the same, and differing variously became clear.

[0005] the air capacity with which this invention person is variously sent into each heater unit 2 in the conventional multiple-string type air preheater from the 1st heater unit 2 in the position near the supplied-air side of an airpipe 1 to the 4th furthest heater unit 2 as a result of an experiment and research -- abbreviation, although it must be the same In order that three fourths of the air of the full flow may cross the entrance of the 1st heater unit 2 at an abbreviation right angle in fact, spot softening phenomena are produced. In order that the amount of the actual air included in the 1st heater unit 2 might decrease sharply, it found out the heater element 6 in this 1st heater unit 2 having elevated-temperature-ized, and having caused the early open circuit, and that the same was said of the 2nd heater unit 2.

[0006] Moreover, making equal temperature of the hot blast which variation is in the size and ventilation resistance of the resistance of a heater element 6 and a quartz tube 5, and comes out of each heater unit 2 for every heater unit in fact also except the above-mentioned reason found out the difficult thing.

[0007] this invention is accomplished based on the above-mentioned knowledge.

[0008]

[Means for Solving the Problem] Two or more heater units which estranged mutually the multiple-string type air preheater of this invention in accordance with the shaft orientations of an airpipe and this airpipe, and were arranged, It consists of each [these] heater unit, piping which opens between the above-mentioned airpipes for free passage, respectively, and the flow regulation mechanism for adjusting the flow rate of the air to each above-mentioned piping. It is characterized by enabling it to amend the difference of the air capacity which passes each heater unit produced by difference of the array position at least according to this flow regulation mechanism.

[0009]

[Example] A drawing explains the example of this invention below.

[0010] The flow regulation screw thread 7 with a diameter of 5mm which can decrease in number the cross section in this piping 3, respectively is made to screw in each piping 3 which connects between each heater unit 2 with the common airpipe 1 as this invention is shown in drawing 1 . adjusting this flow regulation screw thread 7 -- above-

mentioned the 1 - the difference of the passage air capacity of each heater unit produced by the difference of an array position to the above-mentioned piping 3 of the 4th heater unit 2 is made to amend

[0011] Moreover, by the above-mentioned variation etc., the actual hot blast temperature from the outlet of each heater unit 2 tunes further the above-mentioned flow regulation screw thread 7 finely, in not being mutually equal.

[0012] Drawing 2 shows other examples of this invention, and prepares them in the position corresponding to each above-mentioned piping 3 of the airpipe 1 common to the above of each above-mentioned flow regulation screw thread 7 in this example, and it is made to make the cross section of the entrance of each above-mentioned piping 3 adjust by this.

[0013]

[Effect of the Invention] Since the multiple-string type air preheaters of this invention are the above composition, they can adjust the temperature of the hot blast from each heater unit to desired constant value irrespective of the variation in the property of the array position of each heater unit, or each part, and have the big profits which can lengthen the life.

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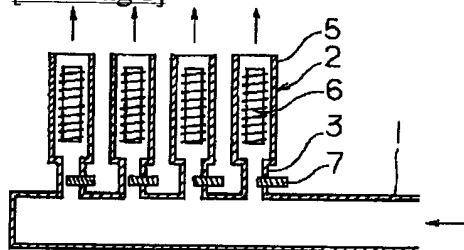
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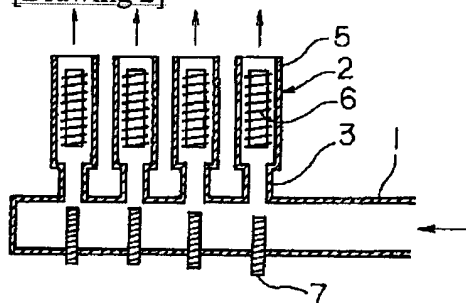
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DRAWINGS

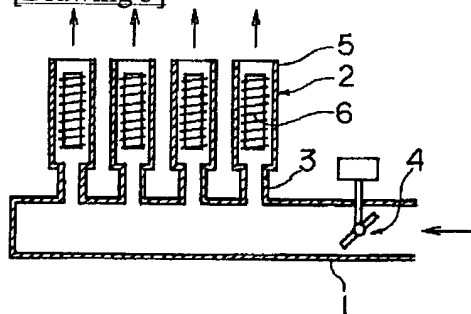
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]

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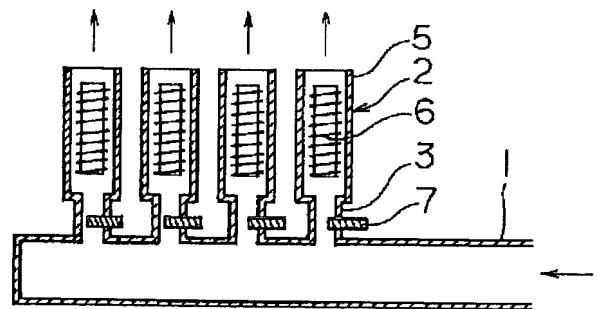
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(54)【発明の名称】 多連型エアーヒーター

(57)【要約】

【目的】 本発明の目的は、各ヒーターユニットからの熱風温度を所望の一定値に調節できる多連型エアーヒーターを得るにある。

【構成】 共通の送気管に、その軸方向に沿って互いに離間して配列した多数のヒーターユニットに夫々流量調節機構を設け、これによって各ヒーターユニットを流れる風量を夫々一定ならしめるようにした多連型エアーヒーター。



【特許請求の範囲】

【請求項1】 送気管と、この送気管の軸方向に沿って互いに離間して配列した複数のヒーターユニットと、これら各ヒーターユニットと上記送気管間を夫々連通する配管と、上記各配管に対する空気の流量を調節するための流量調節機構とより成り、この流量調節機構によって少なくともその配列位置の相違によって生ずる各ヒーターユニットを通過する風量の差を補正できるようにしたことを特徴とする多連型エアーヒーター。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は多連型エアーヒーター、特に、プラスチック製品のバリ取り、可塑性プラスチックの溶接、ICの半田付け、紙バック用容器のシール等の際の加熱に用いる多連型エアーヒーターに関するものである。

【0002】

【従来の技術】図3は従来の多連型エアーヒーターを示し、1は共通の送気管、2はこの送気管1の軸方向に沿って互いに離間して配列した複数の筒状のヒーターユニット、3はこの各ヒーターユニットと上記共通の送気管1間を夫々連通する配管、4は上記共通の送気管1の管路に介挿した空気流量調節バルブである。

【0003】上記各ヒーターユニット2は、両端開口の例えば外径15mm、内径12.5mm、長さ70mmの透明な石英管5と、この石英管5内に配置した鉄クロムアルミ系、ニクロム系または白金系のヒーターエレメント6とより成り、送気管1内に例えば2kg/cm²以下の圧力で送られた空気は石英管5を通るときにヒーターエレメント6によって加熱され、各石英管5の出口から例えば800℃、50リッター/分の熱風となって矢印に示すように被加工物に放射される。

【0004】

【発明が解決しようとする課題】然しながら、このような従来の多連型エアーヒーターにおいては、各ヒーターユニット2の寿命が同一でなく、種々異なることが判明した。

【0005】本発明者は種々実験、研究の結果、従来の多連型エアーヒーターにおいては、送気管1の送気側に最も近い位置にある第1のヒーターユニット2から、最も遠い第4のヒーターユニット2迄、夫々のヒーターユニット2に送り込まれる風量は略同一であるはずであるが、実際には第1のヒーターユニット2の入口を全流量の3/4の空気が略直角に横切るため吸込現象を生じ、第1のヒーターユニット2に入る実際の空気の量は大幅に減少するためこの第1のヒーターユニット2内のヒーターエレメント6が高温化し早期断線を招いていること、また第2のヒーターユニット2も同様であることを見出した。

【0006】また、上記の理由以外でも、実際には各ヒ

ーターユニット毎に、ヒーターエレメント6の抵抗値、石英管5のサイズ及び通気抵抗にバラツキがあり、各ヒーターユニット2から出る熱風の温度を等しくすることは困難であることを見出した。

【0007】本発明は上記の知見を基として成されたものである。

【0008】

【課題を解決するための手段】本発明の多連型エアーヒーターは、送気管と、この送気管の軸方向に沿って互いに離間して配列した複数のヒーターユニットと、これら各ヒーターユニットと上記送気管間を夫々連通する配管と、上記各配管に対する空気の流量を調節するための流量調節機構とより成り、この流量調節機構によって少なくともその配列位置の相違によって生ずる各ヒーターユニットを通過する風量の差を補正できるようにしたことを特徴とする。

【0009】

【実施例】以下図面によって本発明の実施例を説明する。

【0010】本発明においては図1に示すように共通の送気管1と各ヒーターユニット2間を接続する各配管3内に夫々この配管3内の断面積を減少できる例えば直径5mmの流量調節ねじ7を螺合せしめ、この流量調節ねじ7を調節することによって上記第1～第4のヒーターユニット2の上記配管3に対する配列位置の相違によって生ずる各ヒーターユニットの通過風量の差を補正せしめる。

【0011】また、各ヒーターユニット2の出口からの実際の熱風温度が上記バラツキ等により互いに等しくない場合には上記流量調節ねじ7を更に微調整する。

【0012】図2は本発明の他の実施例を示し、この例においては上記各流量調節ねじ7を上記共通の送気管1の上記各配管3に対応する位置に設け、これによって上記各配管3の入口の断面積を調節せしめるようにする。

【0013】

【発明の効果】本発明の多連型エアーヒーターは上記のような構成であるから、各ヒーターユニットからの熱風の温度を各ヒーターユニットの配列位置や各部の特性のバラツキにかかわらず所望の一定値に調節でき、その寿命を長くできる大きな利益がある。

【図面の簡単な説明】

【図1】本発明の多連型エアーヒーターを示す縦断面図である。

【図2】本発明の多連型エアーヒーターの他の実施例を示す縦断面図である。

【図3】従来の多連型エアーヒーターを示す縦断面図である。

【符号の説明】

- 1 送気管
- 2 ヒーターユニット

(3)

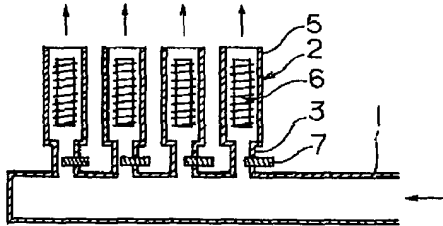
特開平6-272963

- 3 配管
4 空気流量調節バルブ
5 石英管

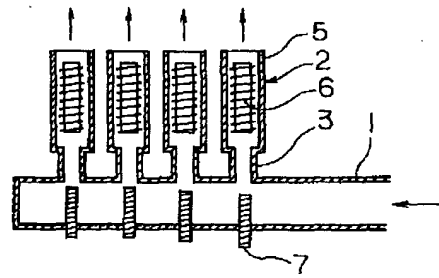
- * 6 ヒーターエレメント
7 流量調節ねじ

*

【図1】



【図2】



【図3】

